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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/630,037	07/30/2003	Ramachandra N. Pai	BEA920030015US1	7080

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EXAMINER

CHANKONG, DOHM

ART UNIT	PAPER NUMBER
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2452

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/630,037	Applicant(s) PAI, RAMACHANDRA N.	
	Examiner DOHM CHANKONG	Art Unit 2452	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 July 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,5,7-10,12,14-16 and 18-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 5, 7-10, 12, 14-16, and 18-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

This final rejection is in response to Applicant's amendment which was filed on 7/1/2009. Claims 1, 7, 12, 19, and 20 are amended. Claims 3, 4, 6, 11, 13, and 17 were previously cancelled. Accordingly, claims 1, 2, 5, 7-10, 12, 14-16, and 18-20 are presented for further examination.

Response to Arguments

Applicant's amendment to claims 7 and 12 overcome the § 101 rejection. However, Applicant's amendment to claim 1 is not sufficient to overcome the § 101 rejection. In order to pass the M-or-T test (for a method claim), the use of the particular machine must impose a meaningful limit on the claim's scope.

Here, the updating step, by a processor, appears to be just data gathering and therefore is impose a meaningful limit on the method steps. The examiner suggests further amending the claims to particularly tie the claimed process to a machine such that all of the steps of the claimed method are machine implemented. For the foregoing reason, the § 101 rejection of claim 1 is maintained.

There is a new ground of rejection in this action to respond to Applicant's amendments further limiting the claims to a computer cluster.

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Allowable Subject Matter

Claims 19 and 20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claim 1 is rejected under 35 U.S.C. §101 because the claimed invention is directed towards non-statutory subject matter. Based on new guidance from the Board of Patent Appeals and Interferences in the informative opinion, *In re Bilski* (and pending review by the Federal circuit), this action contains a new §101 rejection of claims 1, 2, 5, and 18 because the claims are directed towards mental steps. In *Bilski*, the Board found that the absence of any apparatus in the appellants' method claim was evidence that the claims did not transform physical subject matter as a machine inherently would. It is the current position of the PTO that a §101 method or process must (1) be tied to another statutory class (such as an apparatus) or (2) transform underlying subject matter (such as an article or materials) to a different state or thing.

Adding "by the processor" to the updating step is not sufficient to tie the claimed process to a machine. The particular machine tie must impose a meaningful limit on the claim's scope. The claim should therefore be amended so that the claimed process is meaningfully tied to a machine. One way of achieving this would be amend all of the claimed steps so that they are all machine implemented.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1, 7, 12, 19, and 20 are rejected under 35 U.S.C. 112, first paragraph, because steps for maximizing the group member critical or essential to the practice of the invention are not included in the claim(s). The claims recite updating a connectivity count for all the vertices in the graph and selecting a vertex having a least sum of connectivity count of all neighboring vertices. The claims are omitting the essential step of determining which vertex to select when there are *multiple* vertices having the *same* least sum of connectivity counts.

Applicant's specification describes this situation and its corresponding solution: "If there is more than one vertex of the least connected vertices with the same connectivity count, the algorithm will *select the vertex which when removed will affect the connectivity of the least connected vertices.*" [Applicant's printed publication 20050027780, 0016].

This step is essential to the practice of the invention because there will be instances where vertices have the same connectivity count and should therefore be included in the claims. Applicant's claims fail to include this essential step and therefore are rejected under § 112, first paragraph.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

I. CLAIMS 1 ARE REJECTED UNDER 35 U.S.C. § 103(A) AS BEING UNPATENTABLE OVER ABELLO ET AL, “MASSIVE QUASI-CLIQUE DETECTION” (2002) [“ABELLO”], IN VIEW OF NATARAJAN ET AL, U.S. PATENT PUBLICATION NO. 2004|0151121 [“NATARAJAN”].

All citations are to *Abello* unless otherwise noted.

Claims 1, 7, and 12

As to claim 1, *Abello* as modified by *Natarajan* discloses a method for maximizing group membership [pg. 599: discussing the maximum clique problem] comprising:

updating, by a processor, a connectivity count of each vertex in a graph after removing one vertex from said graph [pg. 600: discussing vertices with degrees - the degrees read on the claimed connectivity count], wherein each vertex represents a single hardware component [*Natarajan*, 0002: nodes in a graph represent switches in a network], and wherein the connectivity count of a vertex is a number of neighbors connected to the vertex [pg. 600: degrees of a vertex represent to how many other vertices the vertex is connected (edges)];

placing vertices in decreasing order of connectivity based upon said calculated connectivity count of each vertex in said graph [pgs. 600: discussing placing vertices in order of their degrees starting from degree 1 and increasing to $k-1$ | pg. 601: pruning vertices “in increasing degree order”];

selecting a vertex with a least sum of connectivity counts of all neighboring vertices from among all vertices having a least connectivity count [pgs. 600-601: the pruning process starts with a vertex of the lowest degree (starting from 1)];

removing said selected vertex from the graph [pgs. 600-601: pruning the vertex]; and

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returning a grouping of interconnected vertices forming a clique of completely interconnected vertices, wherein each vertex in said grouping is connected to each other vertex in said grouping [pg. 600: the process returns a maximum clique | pg. 603: recursively selecting a vertex that will eventually terminate with a maximal set], and wherein each vertex representing a node of a computer cluster and the clique forming an efficient operating cluster [*Natarajan*, 0002 | 0032: determining maximal meshes where each of the nodes in the mesh are fully connected].

As indicated in the foregoing mapping, *Abello* does not expressly disclose that the nodes represent a hardware element of a computer cluster. However, applying *Abello*'s maximal clique algorithm to computer elements was well known in the art at the time of Applicant's invention as evidenced by *Natarajan*. It would have been obvious to one of ordinary skill in the art to have modified *Abello*'s maximum clique algorithm to be applies to computer nodes as taught in *Natarajan*. *Natarajan* discloses that using a maximum clique algorithm such as one taught in *Abello* on a computer network is beneficial because it increases the efficiency of data transfer in the computer network [0002].

As to claims 7 and 12, they are rejected for at least the same reasons set forth for claim 1.

Claims 2, 8, and 14

As to claim 2, *Abello* as modified by *Natarajan* discloses updating said connectivity count for all remaining vertices in said graph following removal of a single vertex from said graph [pg. 601: "updating every time the degrees of both endpoints"]. As to claims 8 and 14, they are rejected for at least the same reasons set forth for claim 2.

Claims 9, 15, and 18

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As to claim 18, *Abello* as modified by *Natarajan* discloses wherein removal of a vertex from said graph with said connectivity count is continuous until the clique of completely interconnected vertices is formed [pg. 600: “recursively delete edges” | pg. 603: recursively selecting a vertex that will eventually terminate with a maximal set]. As to claims 9 and 15, they are rejected for at least the same reasons set forth for claim 18.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Michael Walker et al, U.S. Patent Publication No. 2004|0156321

Ho et al, U.S. Patent No. 7512703.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DOHM CHANKONG whose telephone number is (571)272-3942. The examiner can normally be reached on Monday to Friday [10 am - 6 pm].

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thu Nguyen can be reached on (571)272-6967. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/DOHM CHANKONG/
Primary Examiner, Art Unit 2452